

CLAIMS:

1. A system for non-invasive lysis of sub-dermal tissue by means of focused ultrasonic energy, comprising:
 - (i) a source of ultrasonic energy adapted to operate in continuous wave mode and to focus ultrasonic energy in a focal zone within said sub-dermal tissue, said ultrasonic energy being adapted to induce tissue cavitation in said focal zone;
 - (ii) means for continuous displacement of said source over the skin surface; and
 - (iii) means for determining a safe speed for said continuous displacement, said safe speed allowing to obtain said cavitation while avoiding thermal damage of said tissue.
2. The system of Claim 1, wherein said focal zone is at a depth of 0.3 to 3 cm under the skin surface.
3. The system of Claim 1, wherein said tissue is adipose tissue.
4. The system of Claim 1, further comprising means for measurement of current speed and indication for adjustment of said current speed to said safe speed.
5. The system of Claim 4, wherein said indication is visual and/or audio indication.
6. The system of Claim 1, wherein said source of ultrasonic energy is accommodated in a hand-held applicator.
7. The system of Claim 6, wherein said means for continuous displacement includes a powered traction system.
8. The system of Claim 7, wherein said traction system has driving wheels.
9. The system of Claim 7, wherein said traction system is powered by an electric drive.
10. The system of Claim 3, wherein said focused ultrasonic energy has intensity at least 1000 mW/cm^2 .

11. The system of Claim 3, wherein said source of ultrasonic energy is adapted to emit energy with frequency from 0.1 to 1.5 MHz.
12. The system of Claim 3, wherein the dimension of said focal zone in the direction of displacement is not more than one centimeter.
- 5 13. The system of Claim 3, wherein said means for displacement are adapted for safe speed between 0.2 and 2 cm/sec.
14. The system of Claim 1, further comprising safety means adapted to limit delivery of said ultrasonic energy if said safe speed is not maintained.
15. The system of Claim 1, wherein said source of ultrasonic energy is a
10 piezoelectric transducer.
16. The system of Claim 1, wherein said source of focused ultrasonic energy is a spherical transducer.
17. The system of Claim 1, wherein said source of focused ultrasonic energy is a cylindrical transducer.
- 15 18. The system of Claim 1, wherein said source of focused ultrasonic energy is a phase array.
19. The system of Claim 1, wherein said source of ultrasonic energy has shape adapted for rolling over the skin surface.
20. A method for non-invasive lysis of sub-dermal tissue, said method
20 comprising:
 - (i) Providing a source of continuous-wave ultrasonic energy with parameters adapted to induce tissue cavitation;
 - (ii) Determining a safe speed for continuous displacement of said source over the skin surface, such that said safe speed is slow enough to allow
25 cavitation in the focus zone but fast enough to avoid thermal tissue damage;
 - (iii) Applying said source to the skin surface and focusing the ultrasonic energy in a focal zone at a predetermined depth under the skin; and
 - (iv) Displacing said source over the skin surface maintaining said safe
30 speed.

21. The method of Claim 20, wherein the calculation of said safe speed depends on the intensity of the ultrasonic energy in said focal zone and the ultrasonic energy absorption coefficient of said tissue.
22. The method of Claim 20 further comprising measurement of current
5 displacement speed of said source and indication for adjustment of said current speed towards said safe speed.
23. The method of Claim 20, wherein said source of ultrasonic energy is accommodated in a hand-held applicator adapted for displacement by an operator.
24. The method of Claim 23, wherein said hand-held applicator comprises a
10 powered traction system for said displacement.
25. The method of Claim 20, wherein said tissue is adipose tissue.
26. The method of Claim 25, wherein said ultrasonic energy has intensity at least 1000 mW/cm^2 .
27. The method of Claim 25, wherein said ultrasonic energy is emitted with
15 frequency from 0.1 to 1.5 MHz.
28. The method of Claim 25, wherein the dimension of said focal zone in the direction of displacement is not more than one centimeter.
29. The method of Claim 25, wherein said safe speed is between 0.2 and 2 cm/sec.